

# **Cost savings through eco-efficiency in an accounting office**

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<p>The aim of the thesis is to find hypothetical cost saving scenarios for being eco-efficient in an accounting office. The topic was chosen because it is a central issue in future business. Not only is eco-efficiency a trend that attracts customer but it is also good for the company in the long run.</p> <p>The theoretical part of the thesis covers the core topics in depth, with some relevant theories and models. The core topics are eco-efficiency and cost savings. The main aspects of eco-efficiency are introduced to the reader with some relevant concepts. Cost savings are compared to profitability and the general methods of sensible cost saving are explained.</p> <p>The research methods used in the thesis include both quantitative and qualitative ones: a quantitative survey was created in order to determine the accounting offices' eco-efficiency situation in Finland. After the survey, qualitative observation and data gathering was implemented to support the findings of the survey. The information was then used to obtain the final results of the thesis. Qualitative observation was conducted in a case company, which will be also used in the hypothetical cost saving scenarios. The case company is a Finnish accounting company.</p> <p>The results showed that it is possible to save costs eco-efficiently. However, the cost savings are not high, as the measures taken are not drastic.</p> <p>The scenarios were not tested on a real office. Therefore, the results in real life may vary. Other aspects affecting the results are also the size of the office and its purchasing habits. A case company was used to support the findings of the survey in order to create as realistic scenarios as possible.</p>	
<b>Keywords</b> Eco-efficiency, cost saving, sustainability, accounting office, recycling	

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# **1 Introduction**

Small offices and service-oriented businesses find it hard to see how sustainable their actions and operations truly are. In comparison, implementing sustainable choices in a company with production and other areas of high emission levels seems more significant because the results are easier to detect. This should not however deprecate the importance of being sustainable in a small office or service-oriented business (Hitchcock & Willard 2009, 39.).

The purpose of the thesis is to find out the cost savings resulted from eco-efficient solutions in an accounting office. The thesis will begin with an overview of the background of eco-efficiency and where the reasons for choosing the thesis topic transpire. The key concepts are defined and the international aspect and anticipated benefits and demarcation are briefly explained. As there is no commissioning company, a case company is summarily introduced with some relevant characteristics and facts. Next comes the theoretical framework of the thesis, where the key concentration point and the structure of the thesis are defined with the help of the research question and investigative questions. Before moving to the survey results and final outcomes, methods used in researching are presented. These methods include both quantitative and qualitative methods. In addition to the outcomes from the thesis, some recommendations for further development were suggested in the end of the thesis.

What needs to be pointed out is that all the forthcoming topics are suggestions for improvement, possibly being put into practise somewhere in the future. The change is not supposed to happen in a month by the means of drastic measures. The idea is to do cost savings, therefore the change happens when for example old office materials run out or the electrical appliances have run through their course.

## **1.1 Background**

Sustainability is a hot topic in the business world at the moment. Businesswise it makes perfect sense to have eco-efficient supply chain from suppliers to end-consumers because it will open completely new market opportunities as well as be good to the environment (Zokaei, Lovins, Wood & Hines 2013, 47-48.). More regulations are being instituted especially concerning climate change: Eventually businesses have to change their operations in order to be fully operational in the future (Hitchcock & Willard 2009, 4-5.).

Nowadays it is fairly normal to build new sites eco-efficiently because all the materials can be chosen with eco-efficiency in mind. A notable example is the Olympic stadium built for 2012 summer Olympics in London, which is the most lightweight Olympic stadium ever

built and mostly made of recycled materials (Gray 2012.). In comparison to the stadium in Beijing Olympics in 2008, the amount of steel used in London was less than a quarter of the amount used in the “bird’s nest” (Zhen & Halpin 2008; Smith 2012.).

As the new buildings are being built more and more sustainably, the old buildings and offices are left behind with unsustainable materials. The main idea of the thesis is to make a helping cost saving scenarios to already existing offices. There the change arises from modifying the operations ecologically without additional costs occurring in the process of doing so.

## 1.2 Thesis Topic

The purpose and also the research question of the thesis, is to find out cost savings from eco-efficient solutions in an accounting office, and how exactly they can be achieved. The topic is covered thoroughly through investigative questions: First area of investigation is to find out what eco-efficient practices the offices have done already. Future interest in eco-efficient practices is found out next. After the past and future interests are identified, the results are used for uncovering possible cost savings from eco-efficient practices. Final investigative question covers further recommendations for eco-efficient cost saving practises. The overlay matrix in table 1 shows the relationship between investigative questions and the rest of the thesis in the forms of theoretical framework, research methods and results.

Research Question	
How to save costs by being eco-efficient in an accounting office?	

- |             |   |
|-------------|---|
| <b>IQ 1</b> | What measures have accounting offices taken already towards eco-efficiency?   |
| <b>IQ 2</b> | Interest to implement ecological choices to daily office activities in the future                                   |
| <b>IQ 3</b> | What eco-efficient practices can result in cost savings?  |
| <b>IQ 4</b> | What recommendations can be made to further develop cost effective eco-efficient practises in an accounting office? |

**Table 1. Overlay Matrix**

Investigative Question (IQ)	Theoretical Framework	Research Method	Results
IQ 1. What measures have the accounting offices taken already towards eco-efficiency?	1.6, 2.1	Quantitative survey	4.1.
IQ 2. Interest to implement ecological choices to daily office activities in the future	1.6, 2.1	Quantitative survey	4.1.
IG 3. Can eco-efficiency result in cost savings?	1.6, 2.2	Data analysis, calculations,	5.1, 5.2, 5.3, 5.4
IQ 4. What recommendations can be made to further develop cost effective eco-efficient practises in an accounting office?	2.2	Data analysis	6.1, 6.2

### 1.3 Research Scope

The concentration point of the thesis is narrowed down to a very specific area: It will be a mix of environmental and economic issues (Figure 1.), instead of the complete triple bottom line of sustainability (social, economic and environmental). The environmental issues, in this case emissions and energy consumption etc. are studied together with old office operation styles in order to find out how they impact the company financially. Office environment was chosen due to the researcher's own experience in working in an accounting office and interest in turning old offices into more eco-friendly without making costly purchases.

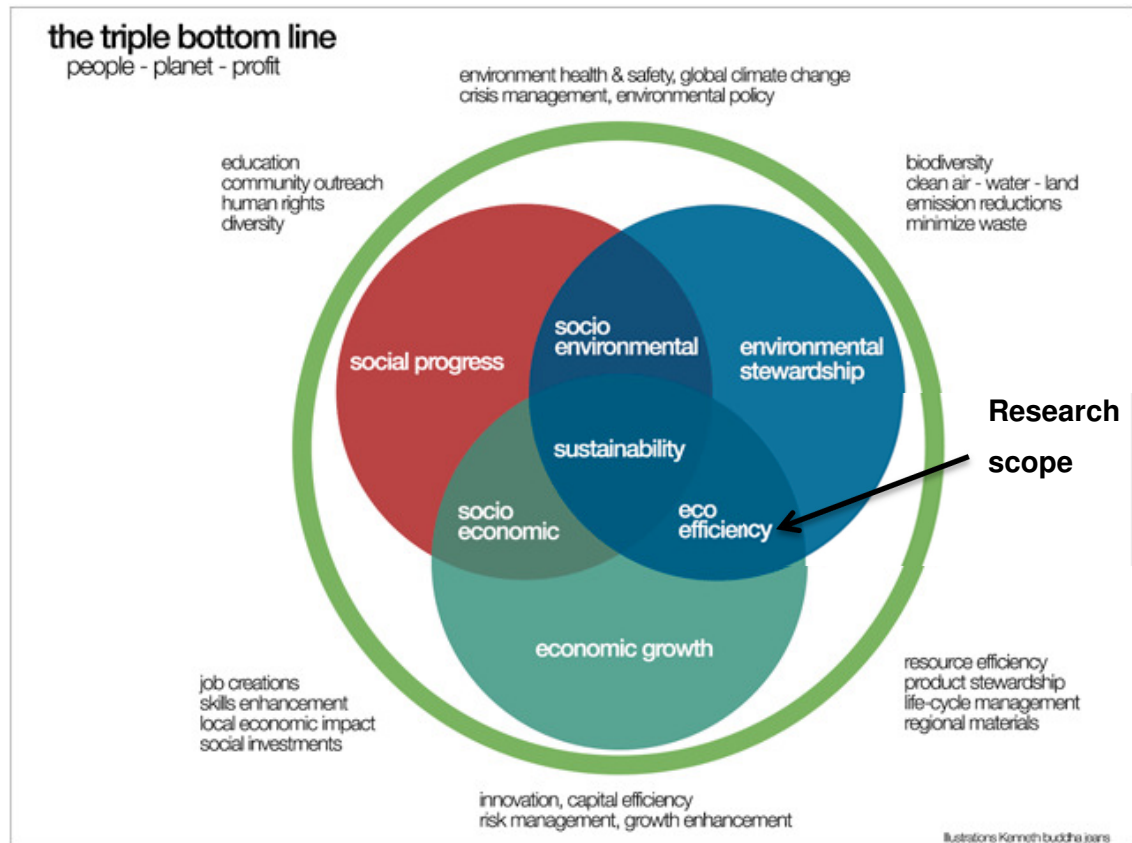


Figure 1. Thesis research scope (Foresight Press 2015.)

The research is conducted in Finnish accounting offices because the case company is a Finnish accounting company and the quantitative survey used was sent to authorized Finnish accounting offices. However, it does not mean that the results of the research couldn't be utilized in offices around the world. Another reason for choosing Finland is its high position regarding sustainability: Even in 2001, Finland ranked highest out of 122 countries in environmental sustainability index, ESI (The Economist 2001.). Environmental sustainability index ranks the countries with an elaborate assessment of multiple variables influencing the environmental health of economies in the world (The Economist 2001.).

#### 1.4 International Aspect

The tips are made suitable for any office to use around the world. The examples are from Finland but some of the offices have other offices or partners abroad, therefore the guide can be used there as well. Sustainability itself is an international hot topic and the offices becoming eco-efficient can access a whole new market internationally.

#### 1.5 Anticipated Benefits

An office becoming more sustainable by being eco-efficient has many anticipated benefits: The most obvious is the cost savings generated from the changes made. However it must

be noted that some of the savings might occur in long-term, especially if special equipment is acquired.

Eco-friendliness creates value to the company and improves the company's image in the eyes of customers' and shareholders'. It is also possible that new customers valuing eco-friendliness are interested in using the company's sustainable services (Hitchcock & Willard 2009, 4-5.).

Among the cost savings and overall eco-friendliness, an inevitable waste and energy reduction will occur when less material is used in the activities and the company will be more aware of the energy efficiency as well. The office will be ahead of time when the presumable future regulations concerning companies' eco-friendliness are established. Instead of modifying the operations according to the new regulations, offices can continue their businesses normally without sparing any extra time or resources to change the office's operating habits (Hitchcock & Willard 2009, 4-5.).

The thesis will be sent to the survey respondents, who left their contact information in the end of the survey. They will get an assisting guide to cost savings through eco-efficiency. The survey results may interest the responding offices as well because it presents the current situation in the Finnish market. It is beneficial for the responders because they will know more about the situation and can use that as a competitive advantage. Furthermore, the cost saving-tips are especially made for accounting offices, which make the implementation easier.

## 1.6 Key Concepts

The main idea of **sustainability** is an economic system being able to function in a way that it is capable to continue so unendingly (Braun & Tietz, 2015, 895.).

**Cost savings** occur when a business saves money by reducing their expenses. In a long-term it is possibly resulted in higher revenue streams. Cost saving tends to be in association with being green as the savings mean less material used and less materials to be recycled. (Smith 2014, 21-22.)

**Eco-efficiency** refers to the production of goods and services resulting from use of less ecological resources and yet being cost saving (Braun & Tietz, 2015, 898.).

**Accounting office** is a financial management company that provides accounting services to companies, entrepreneurs and organizations etc. (Tiltoimistoja 2016.)



**Recycling** refers to treating and processing used materials or products so, that they can be re-used in the future. (Cambridge Dictionaries Online 2016.)

## **1.7 Risks and Risk Management**

Going green often means that purchases for more eco-efficient products and eco-friendlier material increase. In other words, the costs rise up. One risk is that there is no cost savings in being eco-efficient. The approach in the thesis is to work with what is already available in the office and change the habits to eco-efficiency. If something is purchased, it will be compensated with altered working habits to still show the likely cost savings resulted. If there are no cost savings directly from these changes, being eco-efficient is good branding and possible pay back in alternative ways.

Eco-efficiency in a company is still hard to measure. Even though it is constantly trending, accounting wise eco-efficiency is not the simplest yet. With the help of careful demarcation and planning, it is possible to give cost saving tips containing financial information and realistic scenarios.

During the research process was the busiest time of the year in accounting due to completion of financial statements from the financial year of 2015. This brought extra challenge in receiving responses from the survey and getting enough examples from the case company. However, as the survey is only one part of the research process before the end result and only directional to what to do next in the process, the authenticity of the survey isn't particularly fundamental.

In the beginning of the planning, one major concern was the possible lack of examples and too much theory. The thesis is not commissioned by any company, which could easily lead very theoretical thesis. Instead of the commissioning company, there is a case company providing relevant information and a quantitative survey mapping out the eco-efficiency-situation in Finland.

## **1.8 Example Company Introduction**

A company will be used in the thesis as an example to provide some factual numbers and habits, which are then utilized to find out cost savings from eco-efficient practices. The company wishes to remain anonymous therefore it will be called the case company when referred. The case company is an accounting office in Helsinki, founded in the nineties and is currently employing 5 to 9 people. The office is 107,5 square meters big with an open floor plan. In addition to the working spaces, there is one conference room, kitchen

and a bathroom. In the last reported financial year, the turnover of the company was between 400 000 and 700 000 euros.

## 2 Eco-efficiency and cost savings

The following chapter will introduce the reader more in depth to the two key topics of the thesis. The thesis topic's concentration is on eco-efficiency: a mix of environmental and economic factors. Together with cost savings they form the main focus point of the thesis as seen in figure 2.

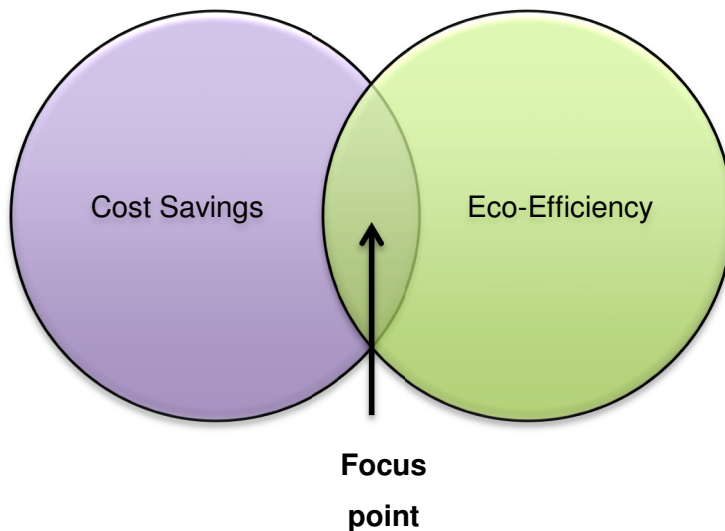
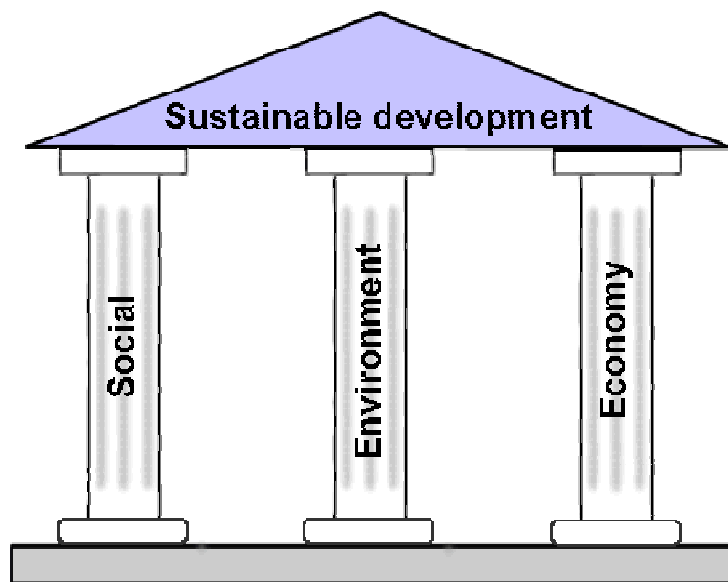


Figure 2. Thesis focus point

### 2.1 Eco-Efficiency –“doing more with less”

Sustainability consists of three pillars: social, environmental and economic, as illustrated in the picture 1. The three pillars are also considered to be the core of a business if they want to succeed in long-term. The use of the three pillars of sustainability has increased among consumers and companies with the long-term prospects in mind (Braun & Tietz 2015, 37.). Big reason for the sudden interest in sustainability is the climate change and reckless extravagance of resources by consumers and companies, which are sooner than later going to get the better of the earth (Howard 2015.). It is fundamental to have a balance of all three aspects of sustainability instead of just one or two because all of the pillars are needed when making business decisions: The three aspects are linked to each other and quite often sustainability doesn't work without all three, at least in the long run (Braun & Tietz 2015, 37.).



Picture 1. The three pillars of sustainability (Sustainability-ed.)

Figure 3. Exhibits some of the core aspects of eco-efficiency, which are also relevant to the thesis research. Eco-efficiency itself is defined as producing competitively priced goods and services while constantly reducing resource consumption and ecological impact in the whole operation process (WBCSD.).

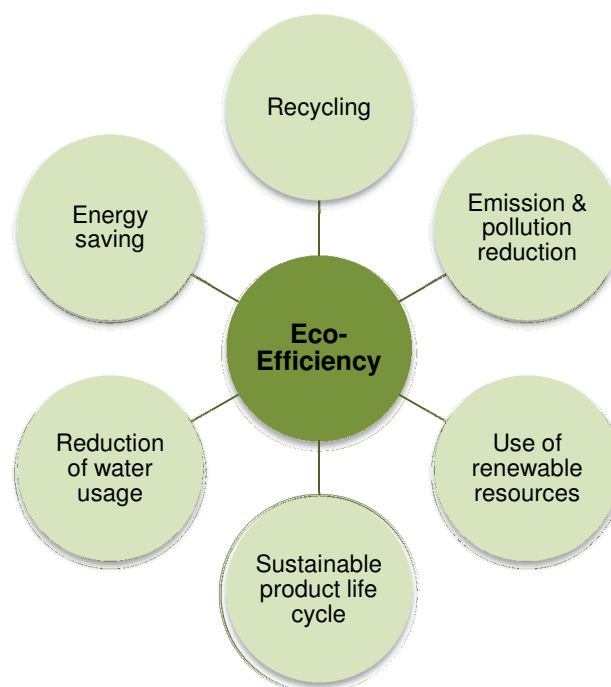


Figure 3. Aspects of eco-efficiency (WBCSD.)

When energy savings are measured, they are called negawatts as opposed to energy consumption measurement, megawatts. If an office wants to save costs in energy consumption, they should look for ways to increase the level of negawatts (Smith 2014, 23.).

Energy is used overall in the office, which is why it should be the first aspect to look for cost saving solutions (Hitchcock & Willard 2009, 43-44.).

In an office, green computing can go far but it requires energy-efficient equipment as well as employees' own effort to work energy-efficiently. When the equipment is in the end of its life cycle, the most sustainable way of getting rid of the equipment should be discovered: sometimes the suppliers have the best ways of recycling the products because they specialize in them. (Hitchcock & Willard 2009, 43-44.)

Recycling itself doesn't save costs or if it does, the amount is very insignificant because small accounting offices don't produce lot of waste in the first place. Recycling however is part of being eco-efficient: it is good for the company, as well as the environment because recycling saves space in the office and when done regularly, it is fairly effortless. Recycling enables the reuse of the materials, which is better than producing completely new ones (Zeller 2008.).

MIPS (Material Input Per Service unit) is a measurement method used in estimating the environmental impacts of products and services. The measurement considers the whole life cycle of the product or a service. MIPS helps businesses to develop innovative and ecological products and services while reducing material input in their production. MIPS tool requires data on intensity of various materials in order to apply. The benefits of MIPS tool include the increased information on environmental performance of a product or a service as well as cost savings from reduction of resources. (Benson 2014.)

The ripple effect in other words means the service organizations' impact on customers through the decisions the organizations are making themselves. For example a supermarket located far from the urban area provides plenty of free parking spaces, which then results in increased emissions and poor air quality among other things. (Hitchcock & Willard 2009, 39-40.)

## **2.2 Cost Savings**

Companies are generally managed with a mind-set where the most important thing is to create profits. Or at least that is what they strive for. Nonetheless, making money should not be associated with saving costs, as these two things are fairly different: It is easy to find new ways of making money with marketing and new products etc. but increased profits are typically linked to increased costs. In cost saving, there is no actual profit created but the profit increases, as there are fewer costs to take care of. (Smith 2014, 21-22.)

In the long term, cost savings create extra value to the gained revenue, as the cuts are only decreasing in time. As cost saving means that use of materials and other resources are reduced, it makes it rather green as well. (Smith 2014, 21-22.)

It is important to keep in mind that cost savings should come from many different actions or operations instead of just one. It is hard to drastically cut costs on one area alone because the effects of the cutback have a relative chain reaction to other actions and operations in the company. The key is to start from small savings in multiple operations or actions and increment the cost savings in time. This minimizes the impact in chain reaction. (Coyne, Coyne & Coyne 2010, Harvard Business Review.)

### 3 Research design

The thesis will have two different research approaches in two phases (Figure 4.) but prior to these research phases, an allocation of possible cost saving areas in the office was conducted. These possible cost saving areas will be used later in the survey and results. The research for areas in need of greener transformation in the office, such as energy consumption, printing, kitchen and toilet use, office supply purchasing and the use of cloud services, is based on personal experience working in an accounting office combined with secondary data found on the topic.

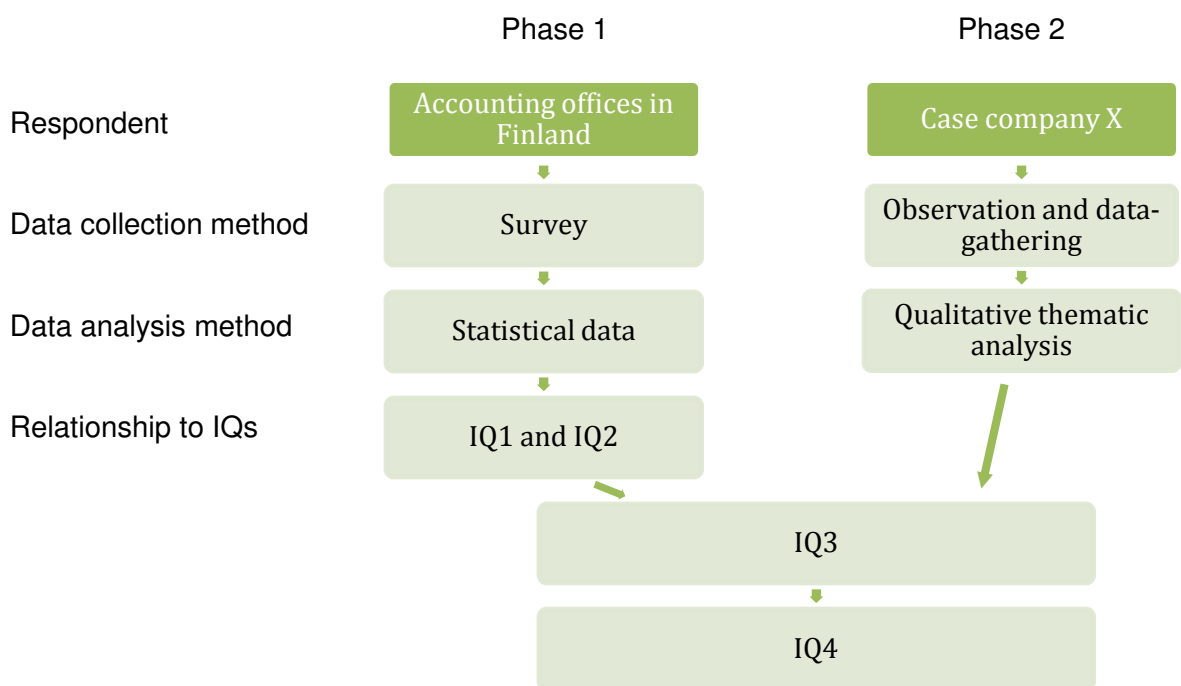


Figure 4. Research design

#### 3.1 Quantitative survey

The first phase, after the background research, is the survey. It was sent in order to map out the areas accounting offices want to improve ecologically regarding their daily operations. The sampling method used in the survey was purposive sampling, where the respondents have specific characteristics uniting them (Lærd Dissertation 2012.); respondents were authorized offices in [www.taloushallintoliitto.fi](http://www.taloushallintoliitto.fi)-website. From these offices, the one's with email addresses on their information page made the final pick to the sample group. The email addresses were collected one by one as there were no lists with all the email addresses accessible. However, Taloushallintoliitto (Association of Finnish account-

ing firms) has a list but they would only provide it if the thesis was commissioned by the union.

The reason for choosing a quantitative survey as a research method was based on an interest in finding out the general level of eco-efficiency in accounting offices in Finland. No evidence of a previous survey was found out during the background research. The survey will generate results for investigative questions 1 and 2.

### 3.2 Observation and secondary data gathering

After the survey was completed and the results are analysed, it was time for phase 2. Phase 2 was carried out during the spring of 2016 (Figure 5.). In phase 2 the researcher observes the working behaviour and habits in a case company. The observations were made while the researcher was working there itself. Case company is a Finnish accounting company employing 5 to 9 people. The purpose of the observation is to record findings and later create example situations in order to illustrate the possible cost savings in an office. These observations are centred on the eco-efficiency of the office. The observation is combined together with secondary data from the case company. The secondary data retrieved is the case company's internal sources, such as invoices and reports. The behaviour observations and secondary data gathering were then formed into possible scenarios of how to change the working habits and the office to more eco-efficient.

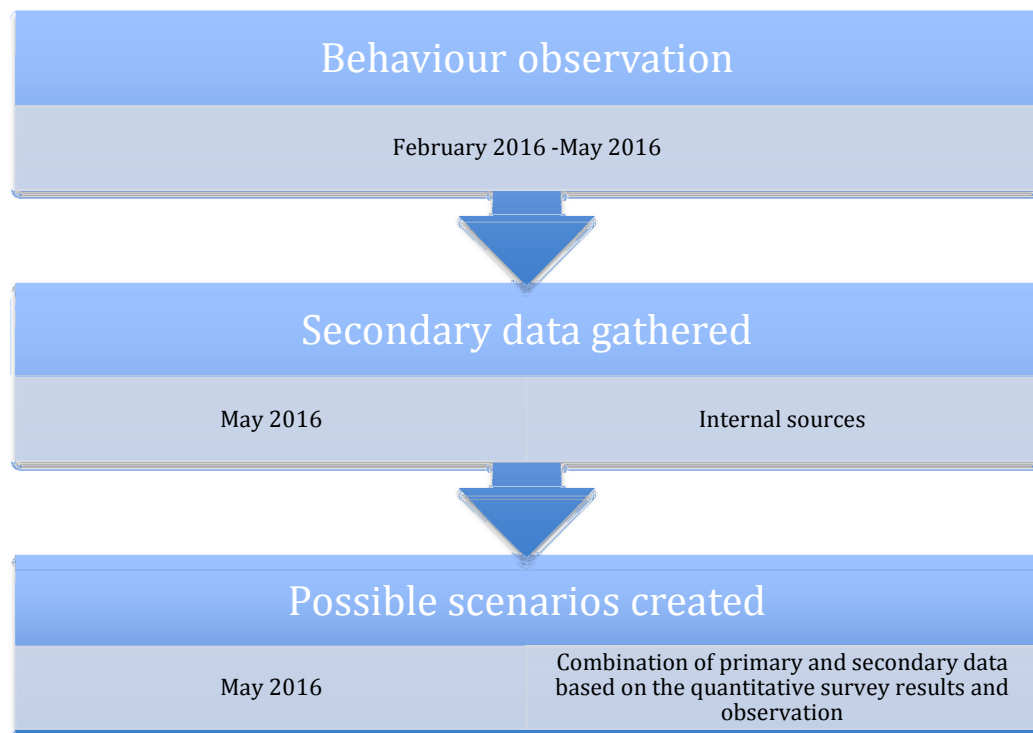


Figure 5. Phase 2 timeline.



Last, a secondary research on the latest eco-friendly solutions and products was conducted and then implemented into the case company's services. The most eco-efficient and cost saving solutions are illustrated with calculations in order to find the best possible solution. The case company observation and data gathering applied to the survey resulted in answers to the investigative question 3 and created a foundation for investigative question 4.

### **3.3 Reliability and validity**

When something is measured, the measures are expected to be valid. The measure is valid when it is capturing exactly what it was meant to capture in the first place. Reliability instead is about the stability of measuring. If the measure is valid, it is also reliable but a reliable measure is not necessarily valid. (Ghauri & Grønhaug 2010, 78-79.)

The quantitative research was obtained during the busiest time in accounting offices: the reporting of financial year of 2015 was closing and financial statements needed to be finished in addition to the monthly bookkeeping. It affected the response rate of the survey, as people were busy with their work. The survey was not the main concentration of the thesis, as it was only conducted to provide some kind of guidance for the real results of the thesis. The timing also made it also harder to obtain the data from the case company, as they were facing the same situation.

The results of the thesis are possible scenarios calculated from primary and secondary data. Even if the scenarios work in theory, there are plenty of other factors that could affect the results when put in practise.

## 4 Key findings from the survey

The survey was sent to 729 offices in Finland and 96 of them responded. The response rate was 13. 2%. The survey had a total of 7 questions and answering time was expected to be no more than 2 minutes. In addition to the survey questions, respondents were given a possibility to leave their email address in case they were interested in finding out the end result (thesis) when finished. Circa 57 % (55 responders out of 96) left their contact details in the end of the survey.

As seen in the table 2., the survey was first sent on the 22<sup>nd</sup> of March, at 7pm. The first week was very slow at receiving responses. Presumably the reason for getting so few responses was the timing because when it was re-sent on the 1<sup>st</sup> of April around 10.30am, the response rate was much higher. During the office hours new message gets more attention when seen right away but if it is one of many when opening the email in the morning, people are less likely to respond.

Table 2. Survey timeline

Action	Date
Email collection started	14.3.2016
Email collection finished	20.3.2016
Survey sent as an email to sample group	22.3.2016
Survey re-sent to the respondents who had not yet answered	1.4.2016
Completing the survey	12.4.2016

### 4.1 Actions already taken towards eco-efficiency

The main idea of the survey was to find out the ways the offices have already improved their environmental friendliness and in which areas they still seek improvement. The figure 6. shows past ecological choices made in the office in light green and interest in future ecological actions in petrol blue. The scale used in the survey is from 1 to 4, 1 being 'not at all' and 4 being 'very much'. The pillars portray the results, which are the scale average of 1 to 4.

Printing and cloud services have the highest average when it comes to past actions and future interest. Generally the interest to implement ecological choices in the future was higher than past actions. Cloud services were the only area where the interest lessened.

As seen in figure 6., the difference between past actions and future interest isn't great but it is in the right direction. The high interest in cloud services is likely to affect the interest in printing specifically because cloud services reduce paper usage hence printing as well. In other words, reduced printing is a by-product of increased use of cloud services.

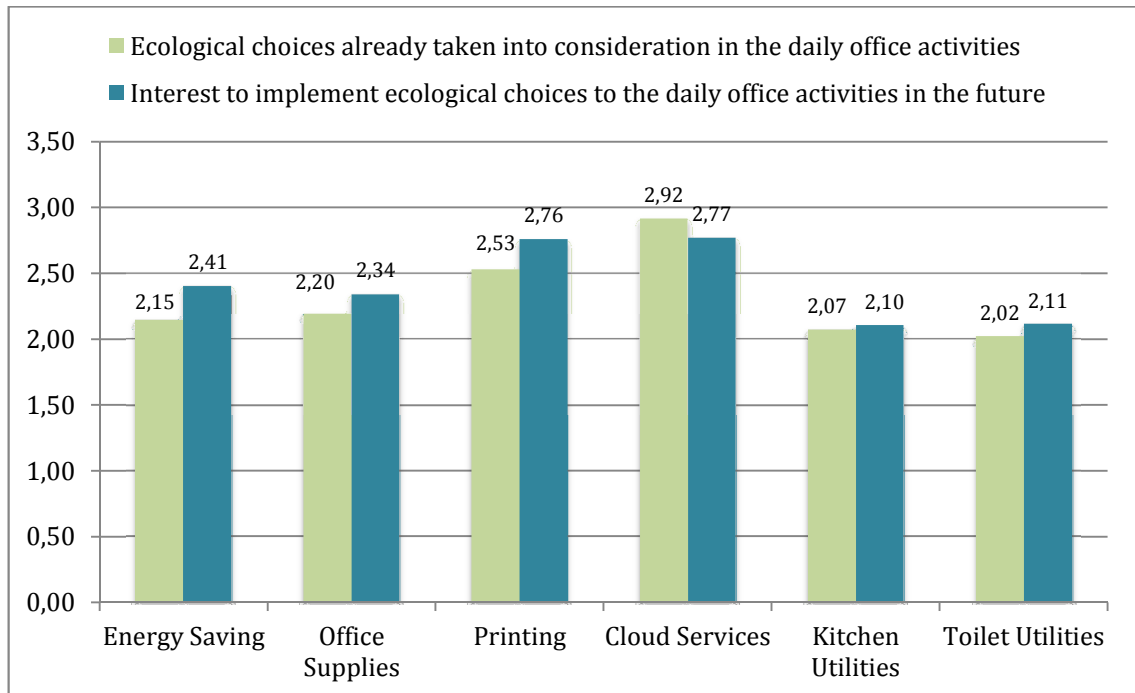


Figure 6. Eco-efficiency in accounting offices

## 4.2 International point of view

The third question of the survey asked the respondents whether they had any international affiliations, such as clients or offices abroad. This was done to find out whether there were any correlations between being international and eco-efficient. 28 % of the respondents had some international activities and the rest 72 % did not.

As seen in figure 7., there is a notable difference between offices with international affiliations and offices without the internationality. In all but one area (energy saving), the international offices have done more already in comparison to the national offices.

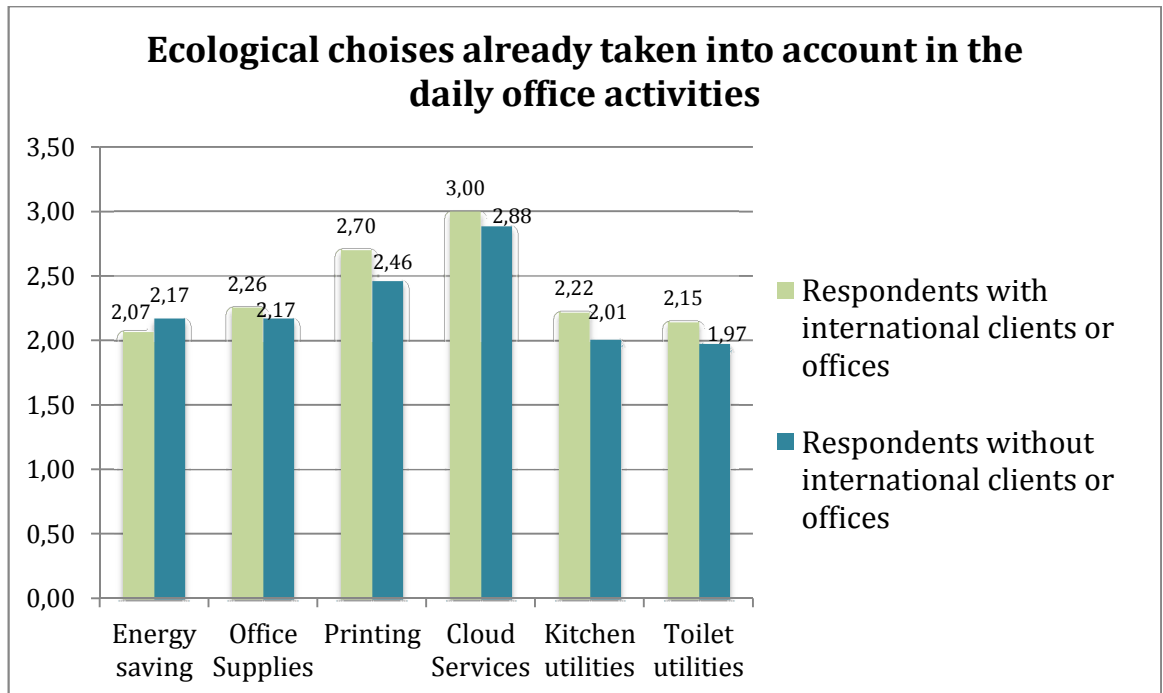


Figure 7. Differences of past ecological choices made in an international and national accounting office

Overall the rates between the past actions (Figure 7.) and future interest (Figure 8.) in eco-efficient offices decrease in the most obvious office operations, which are energy saving, office supplies, printing and cloud services. Kitchen – and toilet utilities, the “not so obvious” office operation areas got higher rates while the rest declined. An assumption for the result is that because they are not considered as the core operations of an accounting office, they are easily forgotten. It does not however mean that these two are any less important than the rest.

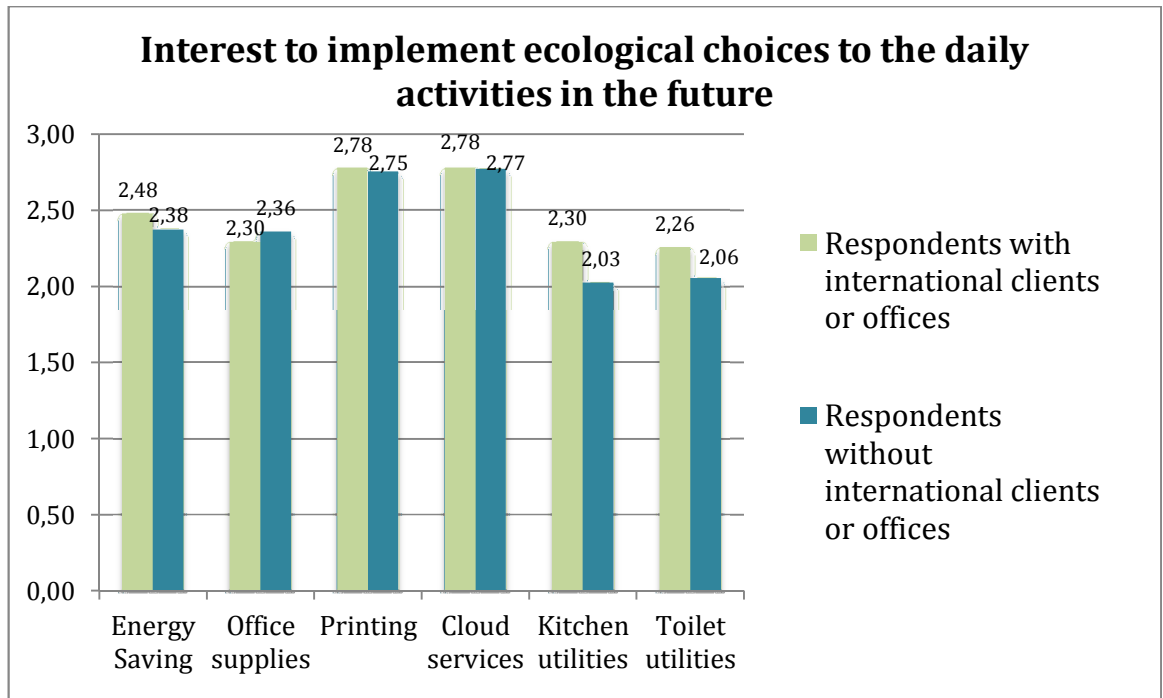


Figure 8. Future prospects of implementing eco-efficiency in an accounting office

It is hard to say exactly, why the previously explained factors are receiving more or less interest in the international offices without further research. Out of own experience and knowledge, a assumption for the reason why printing and cloud services are already ecological, is that it is simpler to concentrate on cloud services because the flow of documents and materials between offices is faster. Consequently, printing abates due to increase in e-finance.

International offices tend to be bigger than national offices, which brings us to the assumption where the choices made in an international company have a larger impact than in small offices. That is why they pay more attention to eco-efficiency and cost saving.

## **5 Results**

This chapter introduces the reader to the eco-efficient cost saving practises in an accounting office. With the help of the quantitative survey and case company data, the practices are portrayed as realistic cost saving scenarios. Each practice area is reviewed on its own sub-chapters with some useful cost saving tips in addition to the scenarios.

### **5.1 Energy Saving**

Energy savings are normally the first thing that comes to mind when thinking about savings costs in an office. Granted, energy is used in some form in almost every office operation, which is the reason for thinking of it first.

#### **5.1.1 Green computing**

First thing to consider is what measures are taken towards green computing: there is a possibility to replace old devices to newer similar models with better energy efficiency, or replace them with different devices (e.g. from desktop computers to laptops) (Smith 2014, 26.). However in an accounting office it is not recommended as most of the work is done with a computer and efficient equipment is needed. In addition to these measures, the cheapest version is to use the old devices and change the using habits.

The simplest manner to be eco-efficient is to turn off the monitors and computers when not in use. Monitors are also good to turn off when going to a meeting in the middle of the day, or whenever it is not used for a longer time (Smith 2014, 26). The energy used when leaving the computer monitor on overnight is equivalent to 500 A4 printouts with a laser printer (University of Cambridge 2016.).

If the company wants to get new devices to replace the old ones, it is recommended to get devices that are Energy Star –certified. The U.S. Environmental Protection Agency (EPA) established Energy Star- certification in order to make businesses and consumers more energy efficient. (Energy Star 2015.)

#### **5.1.2 Electricity Usage**

The expectation is, that when an appliance is not used and it is switched off, it won't use any energy. The expectation is wrong: The term "vampire power" is used from the electricity lost to electronics not being used actively. It refers to vampires sucking blood involuntarily. (Schueler 2015.)

A household with approximately 40 electronic appliances on standby could consume up to 10 % of the total power used in the household (Sackman 2012.). Comparing this to a small accounting office: Considering all the computers and screens in addition to printers, faxes, table calculators etc., the vampire power consumed could be even more. The best way to minimize the vampire power is to use power strips that can be switched off from the strip itself. It is simple and very quick, as one doesn't have to unplug the appliances one by one rather than just click one button. Power strips are also fairly priced and found in most of the bigger supermarkets and electronic stores among many others.

Using the case company as an example: An accounting office wants to buy the power strips but not increase their costs. How long will it take to get back the money from the purchased power strips? The assumption is that the use of power strips will reduce the electricity usage by 10 %. The case company's electricity consumption was 8213 kWh in 2015 and it cost 1078.50 € (incl. VAT 24 %). An average cost of 4 different power strips in Clas Ohlson is 8.24 € (Clas Ohlson 2016.). The case company would need to purchase 12 power strips to cover all the working stations as well as other electric appliances in the office. 12 power strips with the average price cost 98.88 € (incl. VAT 24 %). If the use of power strips will save up to 10 % of the electricity consumption, the money saved in electricity would amount to 107.85 €. So the cost savings in the first year would be 8,97 € only from the use of power strips. The years following there won't be a need to buy new power strips; hence the cost savings will be greater.

## **5.2 Office supplies**

The first thing to consider when purchasing office supplies, is the environmentally friendliness of the supplies. If the current supplier does not sell environmentally friendly versions of products, one could consider changing the supplier. There are suppliers whose whole business is based on supplying only ecological products. Such suppliers are for example Eco-Toimistotarvikkeet –an ecological office equipment web store.

Based on previous observations in offices, there are plenty of pens and highlighters in everyone's drawers that are only half used up. They are set aside when new pens are purchased. Before purchasing new batches of pens, consider using up the old ones first. If the pens are not used, they will eventually end up just being thrown away. Using the old pens first will save costs since there will be no need for purchasing new. Granted, it is only a temporary solution but a cost saving nonetheless.

Xerox is a company selling printers and other document technology products as well as several business services, such as centralized print services (Xerox 2016.). Xerox has

made a compact list of eco-friendly tips that aren't increasing costs. These tips include the following:

1. Products should be bought in bulk because they use less packaging material and the cost per unit is smaller than in smaller packages.
  2. Empty toner cartridges are recommended to recycle, as they are easy to refill and reuse. Some suppliers will take the cartridges back when emptied and recycle them themselves.
  3. When printing, use draft mode or other similar toner-saving mode to make the cartridge last longer.
- (Xerox 2011.)

Table calculators are facing the end of era as numerous things in the office are nowadays done electronically. That includes calculating as well. Table calculators not only consume energy in their standby position but also require paper and ink to record the numbers. Microsoft Excel provides the same feature, where there is no need for printing the numbers on a roll of paper. Microsoft Excel is a standard program used in accounting offices, therefore the use of Excel will not result in any additional costs that the use of table calculator would.

### **5.3 Cloud services**

Nowadays, more and more accounting can be done completely electronic. It is enabled with the help of cloud-based services. Cloud services are considered to be more efficient than in-house data centres because the cloud service providers have only one concentration point: providing the service to its customers. In-house data centres instead have many different things to work on simultaneously, which makes the response time to queries longer. (Smith 2014, 28.)

Even though the use of cloud services is constantly growing, they are still at a fairly immature stage. A good thing to remember is that if an office is offered a new service for free to use, it should be at least tried. Obviously new service comes with risks but if successful, it could be very expensive in few years. Adobe Photoshop was at early stages given away for free, but now it costs a small fortune. The companies do this to gain market share quickly in order to grow as a company. (Smith 2014, 29.)

Recommending cloud services to customers is a positive ripple effect accounting offices are creating. Cloud services reduce the use of paper in both ends, as customers start using electronic invoices instead of mailed versions. The accountant also does not need so many folders to store the papers in. One good example of space and time saving cloud service is e-Tasku. e-Tasku lets the customer take pictures of receipts that are then sent directly to the accountant (e-Tasku 2016.). The receipt has all the information including



date, price, VAT easily accessible without having to spend lots of time sorting them out (e-Tasku 2016.).

Increasing the use of cloud services is in straight correlation to decreased use of printing paper, ink and folders. As all the invoices and receipts are archived in variable cloud services, there is no need for printing or filing.

#### 5.4 Paper usage and printing

Any amount of paper usage reduction saves costs. Moreover it is possible to change the paper material to ecological and recycled paper in order to increase the eco-effectiveness. However, eco-paper is often more expensive than normal copying paper.

The case company purchases paper approximately thrice a year. The total cost for the annual paper usage is 900.00 € (Excl. VAT 24 %), which consists of 180 00 pieces of paper. The paper is Future A4 copy paper, which is already a sustainable choice for an office but there could still be more to do ecologically: Recycled office premium A4 paper is 100 % recycled fibre therefore even more ecological choice (Eco-toimistotarvikkeet 2016.). As previously mentioned, the sustainable choice doesn't come cheap though: one rickets of paper costs 4.49 € to Future A4 copy paper's 2.50 € a rickets.

Imagining that the case company wants to change their Future A4 copy paper to Recycled office premium A4 paper. One pallet of office premium has 200 rickets and costs 898.00 € (excl. VAT 24 %). The company would have to decrease their printing by 80 000 pieces of paper, which is almost 45 % of the previously printed amount.

Table 3. Comparison of different copy papers

Paper	Future A4 copy paper	Recycled office premium A4 paper *
Price per rickets	2,5 €	4,49 €
One pallet	120 rickets	200 rickets
Pieces of paper in a rickets	500	500
Pieces of paper per pallet	60 000	100 000
Price per pallet	300,00 €	898,00 €

\*(Eco-toimistotarvikkeet 2016.)

The amount of paper, need to be saved, is quite significant if wanting to use the recycled office premium –paper while saving costs as well. What needs to be remembered is that the increased use of cloud-based services is at the same time decreasing printing. So

when something is printed, its ecological footprint is smaller because it is printed on a recycled paper, double-sided. For an office that hasn't previously printed double sided when possible, it could save plenty of paper. The reduction of printing could be more significant than to an office that already prints double-sided.

## **5.5 Common areas**

Kitchen and toilet use are not the most obvious "operations" that come to mind when thinking about office operations. Of course they are not part of accounting and that is why they are often forgotten. Nonetheless, kitchens and toilets are as important as printing or office supply purchasing because they are used many times a day.

### **5.5.1 Sanitation Facilities**

Joe Smith, a lawyer from Oregon, USA demonstrates in his Ted Talk in March 2012, how one can manage with only one paper towel when drying hands. People commonly take more than one paper towel because they feel that one towel doesn't dry their hands altogether. Joe Smith proves them wrong with his "shake and fold" approach. Simple steps for drying hands with only one paper towel:

1. Wash your hands normally
2. Shake your hands 12 times
3. Fold the paper towel once
4. Dry your hands

(Smith 2012.)

The case company buys Tork C-fold paper towels. One package has 120 paper towels and they are bought in a case of 12 packages. One case costs 54.80 € (excl. VAT 24%). C-Fold is double layered paper and one paper towel dries hands well.

Assuming that people use the toilet 2 to 4 times during a normal 8-hour –workday. People using the toilet in the case company amounts to 5 to 9 people. Using the mean of both numbers, 3 and 7 respectively, the toilet is used 105 times a week, 5292 times a year (base on 252 working days in 2015). One Tork C-fold case has a total of 1440 paper towels. If every employee uses only one towel at the time, there would be need for 4 cases a year, that would amount to a cost of 219.20 € (Excl. VAT 24 %).

Joe Smith's "shake and fold" -approach presented in his Ted Talk was proven to work on thicker and thinner paper, therefore implementing the "shake and fold" –approach could save even more money and environment: Tork also provides single fold paper towels in a packages of 300 paper towels. One case consists of 15 packages and costs 48.95 € (excl. VAT 24 %) (Eco-toimistotarvikkeet 2016.). The cases needed for one year would cost

97.90 € (Excl. VAT 24 %), as one case of single fold paper towels has 4500 towels in total. If the case company would purchase the single fold paper towels instead of the C-fold paper towels, they would save 121.30 € (Excl. VAT 24 %).

Table 4. Tork paper towels comparison

<b>Tork</b>	<b>C-fold paper towel</b>	<b>Single fold paper towel*</b>
Layers of paper	2	1
Paper towels per package	120	300
Packages per case	12	15
Paper towels per case	1440	4500
Price per case (Excl. VAT 24%)	54.80 €	48.95 €
Cases needed per year	4	2

\*(Eco-toimistotarvikkeet 2016.)

The amount of the Tork single fold paper towels per year was precisely 1,17 cases, which means that most of the second case is not even needed. The precise price for one year would then be 57.57 € (Excl. VAT). Breaking the calculation down:

- The amount of paper towels needed annually after the first case is 792 pieces
- The price per single fold paper towel is 0.0108777 €
- $792 \times 0.0108777 = 8.615138 \approx 8.62$  €
- $8.62 \text{ €} + 48.95 \text{ €} = 57.57 \text{ €}$

If the same calculations were made for the C-fold paper towels, the exact amount for one year would be 201.39 € (Excl. VAT 24 %). Using the single fold paper towels is saving even more costs and material used for the production. The total amount saved is 143.82 €.

The most sustainable way of drying hands, especially in a small office would be to use cotton towels. The only obstacle is that the towels should be washed weekly to steer clear of bacteria but with a little effort from the employees, they could take turns on taking the towels home on Fridays and wash the towels during the weekend.

### 5.5.2 Break room

If the office has a dishwasher, there is no point in using disposable cutlery, plates or cups. Not only does disposable dishware create unnecessary waste but also produce large amounts of emissions in the entirety of its life cycle. Simple way of getting rid of the disposable dishware is to use reusable dishware that can be washed. The reusable dishware has its costs as well but the length of the life is far greater than plastic dishware's, which makes it sustainable (The City of Portland 2016.). Even more sustainable version is to ask

the employees to bring old and unused dishware from home. This way no new dishware need to be bought, and unused dishware gets a second chance instead of being thrown away.

As previously mentioned about the use of paper towels in restrooms and alternative options for it, the use of cotton kitchen towels instead of paper towels is also recommended. Especially if cotton towels are used in the restrooms, it would be effortless to take couple of additional towels home for a weekly wash up.

## 6 Conclusions

Cost savings do not mean vast amounts of money saved at once. Instead, it is slow and steady decline in costs that could possibly be useful in some unexpected situations the companies might face in the future. Unexpected situation could be for example an unpredicted and sudden one-time expense. The most important thing is that offices acknowledge the growing need for eco-efficiency and are willing to do something about it. As mentioned several times before, the change comes from little things.

Based on the data acquired from the case company, the results show potential cost saving solutions in various operations. Energy saving is possible if the employees are willing to change their habits, such as switching off computers and screens when leaving the office. Power strips were also proven to be eco-efficient and cost saving even though little extra money was needed to purchase the power strips.

Printing and cloud-services were mentioned few times together while finding out the results. First, the survey indicated that printing and cloud-services were ranked the highest of the operations accounting offices had already made more ecological in the past. Secondly, they were also ranked the highest in the future interest of implementing ecological choices. Thirdly, as mentioned in the results, there is a correlation between printing and cloud-services, as one service is contradicting the other. Luckily, the change is in the right direction since the decrease is happening in printing and cloud-services' use in offices is increasing.

Paper towels are good targets for cost savings because their use is easily measured. The results showed that with Joe Smith's "shake and fold" –approach the amount of paper needed to dry hands is smaller than without it. When changing the paper towels to one layered paper towels reduced the cost even more because one package had more than double the amount of paper than double-layered paper towel package. In small offices however the best solution would be to use cotton towels that employees would take turns in taking home and wash them up. The same works for kitchen towels and if the towels in restrooms are reusable, it would be convenient to wash them all together.

Core things to consider when purchasing new office supplies: buying in bulk saves package material and reduces unit costs, toner cartridges should be recycled and the use of ecological suppliers is recommended. Because waste and material use reduction is important, disposable dishware should be avoided and use of reusable dishware should be emphasized.

The results are based on internal actions in an accounting office but it doesn't consider the impact an office has on its customers and suppliers. The ripple effect is real and should be taken into consideration in the business practises.

Companies reacting now to eco-efficient solutions not only boost the company image but also save time and money from assumable future regulations. Especially, if the eco-efficiency is saving costs, there is no reason not to do it.

The results presented are mostly based on already existing operations and habits in an accounting office but it does not consider the idea of creating new. Part of being eco-efficient and cost saving is to think outside of the box and innovate new ways of managing an eco efficient, yet cost saving accounting office (WBCSD).

## **6.1 Additional eco-efficiency tips**

The results from the survey together with the results from case company observation and data gathering are supposedly cost saving. If a business wants to make more radical changes in the office, a financial investment should be something to consider. Even with smaller investments, businesses can achieve plenty in the long-term.

If one feels lost in the beginning and don't know where to start the eco-efficiency process, WWF's Green Office –certification is there to help and guide into the right direction. Green office pays special attention to recycling, paper usage, energy consumption and sustainable travel to work place (WWF 2016.). Moreover, continuous personnel training and environmental improvements are recommended in order to maintain the level of greenness in the office (WWF 2016.).

Green office -certification can also have a positive effect on the offices' brand image: As all the previously mentioned factors in the thesis are only suggestions to an accounting office, not all of them are required to use. The changes made in the office are for the company's own knowledge. The certification proves the office to be green.

With the certification customers and investors know that the office is green because in order to get the certification, certain requirements must be obtained. The certification may result in new stakeholders who value eco-efficiency and being green in general. As the Green Office –program is international; it could result also in foreign stakeholders.

Green office –certification does however have fees to pay in order to get the certification. For an office with 1-30 employees the fee consists of 1500.00 € admission fee and 2000.00 € annual fee (WWF 2016.).

## **6.2 Further development suggestions**

Eco-efficiency is a concept that constantly receives more awareness in the world both in personal and business life. Therefore the follow-up researches have endless possibilities on which way to analyse them: for example, the same research could be executed in any country in the world, or done more thoroughly perhaps in cooperation with Taloushallinto-liitto in order to get better response rate on the quantitative survey. The correlation between internationally operating offices and past actions and future interests in the office eco-efficiency had an interesting result. It is a potential research topic for the future, especially when the measuring of sustainability and ecological practices get easier in accounting.

## **6.3 Reflection on learning**

The whole thesis process has taught me a lot about myself, and how I work best. Sustainability is a big interest of mine, and being able to use it as a part of my thesis topic has been rewarding. Even though many of the tips given were already in my knowledge, to be able to show some results based on the previous knowledge has given me motivation to research further.

My skills in writing reports and citing sources have improved, and a concept of a report is not as foreign as it used to be. Yet it is not something I am willing to do anytime soon again.

Until now, many of the school projects have been theoretical practises that haven't resulted in anything real. Now I am able to share the thesis to the survey responders who left their contact details. The fact that someone could actually benefit from the results of the thesis seems surreal.

From what seemed to be impossible at first, the thesis writing and researching process have been surprisingly effortless. Being able to get results from a survey that hasn't been done yet has motivated me to continue with the topic in the future.

Working in an office or company that is sustainable, or their services & products offer sustainable choices has been in my mind for a long time. Making this research has only strengthened my wish to choose career in such path. However this is a long-term goal and

for now I have other things planned: In the near future, I want to try and implement some of these eco-efficient cost saving solutions in my work place in order to see if they work in real life.



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## Appendices

### Appendix 1. Thesis survey

### Ekologinen kustannussäästöopas tilitoimistoille

Kyselyn tarkoitus on kartoittaa tilitoimistojen kiinnostuksesta ekologista opasta kohtaan ja määrittää tarkemmat mielenkiinnonkohteet kyseisestä aiheesta.

**1. Kuinka monta työntekijää työllistätte toimistossanne? \***

☐ 1-5  
☐ 6-15  
☐ 16-30  
☐ 31-50  
☐ Enemmän kuin 50

**2. Missä Maakunnassa toimistonne sijaitsee? \***

**3. Onko toimistollanne kansainvälistä toimintaa (Esim. asiakkaita - tai sivukonttoreita ulkomailla)? \***

☐ Kyllä ☐ Ei

### Toimiston ekologisuus

**4. Miten toimistonne päivittäisissä toiminnoissa on otettu huomioon ekologiset vaihtoehdot?**

	Ei lainkaan	Jonkun verran	Paljon	Erittäin paljon
Energiansäästö *	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tavaranhankinta *	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tulostus *	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pilvipalveluiden käyttö *	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Keittiön käyttö ja tarvikkeet *	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vessan käyttö ja tarvikkeet *	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Muu, mikä? <input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**5. Kuinka kiinnostuneita olette kehittämään toimiston eri toimintoja ekologisemmaksi?**

	Ei lainkaan	Jonkun verran	Paljon	Erittäin paljon
Energiansäästö *	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tavaranhankinta *	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tulostus *	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pilvipalveluiden käyttö *	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Keittiön käyttö ja tarvikkeet *	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vessan käyttö ja tarvikkeet *	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Muu, mikä: <input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**6. Olisitteko kiinnostuneita käyttämään ekologista kustannussäästöopasta? \***

☐ Kyllä  
☐ Ei

**7. Jos haluatte, että lähetän oppaan teille sen valmistuttua, laittakaa sähköpostiosoitteenne sille tarkoitettulle kohdalle.**

Sähköposti